Celanese
The chemistry inside innovation™

IMPET® 2700 GV1/20 - PET

Description

20% glass fiber reinforced
Polyethylene terephthalate, 20 % glass fibre reinforced, high flowability, excellent gloss, high modulus

Physical properties	Value	Unit	Test Standard
Density	**94.9**	lb/ft³	ISO 1183
Molding shrinkage, parallel (flow)	**0.2 - 0.4**	%	ISO 294-4, 2577
Molding shrinkage, transverse normal	**0.8 - 1.0**	%	ISO 294-4, 2577
Water absorption, 23 °C-sat	**0.45**	%	Sim. to ISO 62
Humidity absorption, 23 °C/50%RH	**0.2**	%	ISO 62
Viscosity number	**1940**	in³/lb	ISO 307, 1157, 1628

Mechanical properties	Value	Unit	Test Standard
Tensile modulus	**1.19E6**	psi	ISO 527-1, -2
Tensile stress at break, 5mm/min	**19300**	psi	ISO 527-1, -2
Tensile strain at break, 5mm/min	**2**	%	ISO 527-1, -2
Flexural modulus, 23 °C	**1.17E6**	psi	ISO 178
Flexural strength, 23 °C	**25100**	psi	ISO 178
Charpy impact strength, 23 °C	**9.51**	ft-lb/in²	ISO 179/1eU
Charpy impact strength, -30 °C	**9.51**	ft-lb/in²	ISO 179/1eU
Charpy notched impact strength, 23 °C	**3.23**	ft-lb/in²	ISO 179/1eA
Charpy notched impact strength, -30 °C	**3.14**	ft-lb/in²	ISO 179/1eA
Izod impact notched, 23 °C	**3.43**	ft-lb/in²	ISO 180/1A
Rockwell hardness (M-Scale)	**123**	M-Scale	ISO 2039-2
Ball indentation hardness, 30s	**34100**	psi	ISO 2039-1

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10 °C/min	**491**	°F	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	**176**	°F	ISO 11357-1,-2,-3
DTUL at 1.8 MPa	**451**	°F	ISO 75-1, -2
DTUL at 0.45 MPa	**478**	°F	ISO 75-1, -2
DTUL at 8.0 MPa	**176**	°F	ISO 75-1, -2
Vicat softening temperature, 50 °C/h 50N	**482**	°F	ISO 306
Coeff. of linear therm expansion, parallel	**0.128**	E-4/°F	ISO 11359-2
Coeff. of linear therm expansion, normal	**0.528**	E-4/°F	ISO 11359-2
Limiting oxygen index (LOI)	**24**	%	ISO 4589-1/-2
Flammability @1.6mm nom. thickn.	**HB**	class	UL 94
thickness tested (1.6)	**0.1**	in	UL 94
Flammability at thickness h	**HB**	class	UL 94
thickness tested (h)	**0.0315**	in	UL 94

Electrical properties	Value	Unit	Test Standard
Dielectric constant (Dk), 100Hz	**4.6**	-	IEC 60250
Dielectric constant (Dk), 1MHz	**4.1**	-	IEC 60250
Dissipation factor, 100Hz	**30**	E-4	IEC 60250
Dissipation factor, 1MHz	**190**	E-4	IEC 60250
Volume resistivity, 23 °C	**3E14**	Ohm*m	IEC 62631-3-1
Surface resistivity, 23 °C	**>1E14**	Ohm	IEC 62631-3-2
Electric strength, 23 °C (AC)	**787**	kV/in	IEC 60243-1
Comparative tracking index	**PLC 3**	-	UL 746
Arc resistance	**84**	s	Internal

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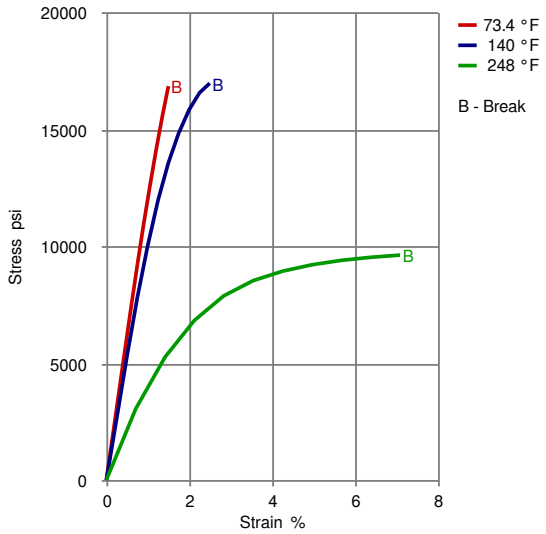
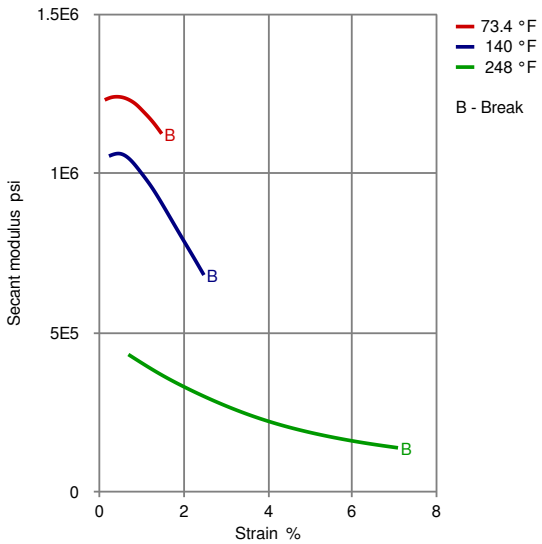
Diagrams

Stress-strain



Secant modulus-strain



Typical injection moulding processing conditions

Pre Drying	Value	Unit
Necessary low maximum residual moisture content	**0.01**	%
Drying time	**2 - 4**	h
Drying temperature	**248 - 284**	°F

Temperature	Value	Unit
Hopper temperature	**68 - 122**	°F
Feeding zone temperature	**104 - 140**	°F
Zone1 temperature	**500 - 518**	°F
Zone2 temperature	**518 - 536**	°F
Zone3 temperature	**536 - 554**	°F
Zone4 temperature	**536 - 554**	°F
Nozzle temperature	**518 - 554**	°F
Melt temperature	**518 - 554**	°F
Mold temperature	**275 - 293**	°F
Hot runner temperature	**518 - 554**	°F

Speed	Value
Injection speed	**fast**

Screw Speed	Value	Unit
Screw speed diameter, 25mm	**80**	RPM
Screw speed diameter, 40mm	**65**	RPM
Screw speed diameter, 55mm	**50**	RPM

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Other text information

Pre-drying

IMPET should in principle be predried. Because of the necessary low maximum residual moisture content the use of dry air dryers is recommended. The dew point should be =< - 30° C. The time between drying and processing should be as short as possible.

Longer pre-drying times/storage

For subsequent storage of the material in the dryer until processed (<= 60 h) it is necessary to lower the temperature to 100° C.

Injection molding

Melt Temperature 270-290 °C
Mold Temperature 135-145 °C
Maximum Barrel Residence Time *) 5-10 min
Injection Speed fast
Peripheral screw speed max.0,3 m/sec
Back Pressure 10-20 bar
Injection Pressure 600-900 bar
Holding Pressure 300-500 bar
Nozzle Design open design preferred

Injection speed, injection pressure and holding pressure have to be optimized to the individual article geometry. To avoid material degradation during processing low back pressure and minimum screw speed have to be used. Overheating of the material has to be avoided.

Ticona recommends only externally heated hot runner systems.

*) If the cylinder temperatures are higher than the recommended maximum temperatures, the max. residence time in the barrel has to be reduced.

Injection Molding Preprocessing

To avoid hydrolytic degradation during processing, IMPET resins have to be dried to a moisture level equal to or less than 0,01%. The drying should be done in a dry-air dryer (dew point < -30°C) with a temperature of 120 to 140 °C and a drying time of 2 to 4 hours. In case of longer residence times in the dry-air dryer, the temperature should be reduced to 100°C.
The time between drying and processing should be kept as short as possible. The processing machine feed hopper should be closed during the processing operation.

Characteristics

Special Characteristics	Heat resistant
Product Categories	Glass reinforced
Processing	Injection molding
Delivery Form	Pellets
Additives	Release agent